WHAT IS CLAIMED IS:

Sub Q1

1. A thin-film magnetic head comprising:

a lower core layer;

a recording core formed on the lower core layer and exposed at a face surface that faces a recording medium, the recording core comprising a structure selected from the group consisting of (1) a lower pole layer, a gap layer, and an upper pole layer sequentially arranged in that order and (2) a gap layer and an upper pole layer sequentially arranged in that order;

an upper core layer magnetically coupled to the upper pole layer; and

a coil for inducing a recording magnetic field to the lower core layer, the recording core, and the upper core layer,

wherein a tip surface of the upper core layer is located at a setback distance from the face surface in a height direction, wherein the height direction is a direction generally perpendicular to the face surface, and the tip surface is one of an inclined surface or a curved surface, such that the setback distance gradually increases in a track width direction, wherein the track width direction is a direction generally parallel to the face surface.

2. A thin-film magnetic head according to Claim 1, wherein a shortest setback distance from the face surface to the tip surface of the upper core layer is equal to or less than a largest length of the recording core measured from the face surface.

3. A thin-film magnetic head according to Claim 1, wherein the setback distance from the face surface to the tip surface of the upper core layer satisfies the relationship about 0 μm < L3 ≤ about 0.8 μm.

4. A thin-film magnetic head according to Claim 1, wherein the upper core

comprises a back surface which is set back from the tip surface in the height direction, wherein the back surface is one of a curved surface or an inclined surface in which the setback distance gradually increases in the track width direction and an inclination angle $\theta 2$ is greater than an inclination angle $\theta 1$, where inclination angle $\theta 1$ is one of the inclination angle of the inclined surface on the back surface relative to the height direction, or the angle of a tangent line at a midpoint between an end of the curved surface near the recording core and an end of the curved surface near an underside of the upper core layer side, and angle $\theta 2$ is one of the inclination angle of an inclined surface on the tip surface of the upper core layer relative to the height direction, or the inclination of a tangent line at a midpoint between an end of the curved surface near the magnetic core and an end of the curved surface at an upper surface of the upper core layer.

5. A thin-film magnetic head according to Claim 4, wherein the inclination angle $\theta 2$ satisfies the relationship about $60° \leq \theta 2 <$ about $90°$.

6. A thin-film magnetic head according to Claim 1, wherein the tip surface of the upper core layer comprises a curved surface which gradually recedes in the height direction and which recedes toward side surfaces of the tip surface, wherein the side surfaces are displaced apart from one another in the track width direction.

7. A thin-film magnetic head according to Claim 6, wherein tangent lines that touch endpoints of the curved surface have an angle of inclination relative to the track width direction of about 30° to about 60°.

8. A thin-film magnetic head according to Claim 1, wherein the upper core layer comprises:

a front region which extends from the tip surface in the height direction and

has a uniform width in the track width direction; and

a back direction region which extends from a side opposite the tip surface in the height direction and in which the width of the back region in the track width direction gradually increases in the height direction.

9. A thin-film magnetic head according to Claim 1, wherein the upper core layer further comprises an edge surface in contact with the upper pole layer, and wherein, at the edge surface, the width of the upper core layer in the track width direction is greater than the width of the upper pole layer in the track width direction.

10. A thin-film magnetic head according to Claim 1, wherein the recording core comprises:

a front region which extends from the face surface in the height direction and has a uniform width in the track width direction; and

a back region which extends from the front region in the height direction and in which a width of the back region in the track width direction gradually increases in the height direction.

11. A thin-film magnetic head according to Claim 10, wherein the upper core layer is connected to at least the back region of the recording core.

12. A thin-film magnetic head according to Claim 1, wherein the gap layer comprises a nonmagnetic metallic material.

13. A thin-film magnetic head according to Claim 12, wherein the nonmagnetic metallic material is at least one material selected from the group consisting of NiP, NiPd, NiW, NiMo, Au, Pt, Rh, Pd, Ru, and Cr.

14. A method for fabricating a thin-film magnetic head that includes a face surface facing a recording medium, the method comprising the steps of:

(a) forming a recording core on a lower core layer, the recording core comprising one of (1) a lower pole layer, a gap layer, and an upper pole layer sequentially deposited in that order on the lower core layer, wherein a width of the lower pole layer and the upper pole layer in a track width direction is determined at the face surface, wherein the track width direction is generally parallel to the face surface or (2) a gap layer and an upper pole layer sequentially deposited in that order on the lower core layer, wherein a width of the upper pole layer in the track width direction is determined at the face surface;

(b) forming an insulating layer at a periphery of the recording core at one of before or after step (a), and making an upper surface of the recording core and an upper surface of the insulating layer substantially level with each other;

(c) forming a resist layer over the recording core and the insulating layer;

(d) forming a core layer pattern in the resist layer by exposing and developing a region other than the core layer pattern so that a tip surface of the core layer pattern is one of an inclined surface or a curved surface which recedes in a height direction as the tip surface ascends from the recording core, wherein the height direction is generally perpendicular to the face surface and wehrein the tip surface is set back from the face surface in the height direction; and

(e) forming the upper core layer by plating a magnetic material in the core layer pattern so that the tip surface of the upper core layer is set back from the face surface in the height direction and a tip surface of the upper core layer is one of an inclined surface or a curved surface in which the depth in the height direction gradually increases in a track width direction.

15. A method for fabricating a thin-film magnetic head according to Claim 14, wherein in step (d), the tip surface of the core layer pattern at the face surface

gradually recedes in the height direction toward each of two side surfaces that are spaced apart in the track width direction, and wherein in step (e), the upper core layer is formed so that the tip surface has a curvature.

16. A method for fabricating a thin-film magnetic head according to Claim 14, wherein the gap layer comprises a nonmagnetic metallic material.

17. A method for fabricating a thin-film magnetic head according to Claim 16, wherein the nonmagnetic metallic material is at least one material selected from the group consisting of NiP, NiPd, NiW, NiMo, Au, Pt, Rh, Pd, Ru, and Cr.